



REMARKS/ARGUMENT

The applicants' attorneys appreciate the Examiner's thorough search and remarks.

Claims 1-9 are pending in the application.

Claims 1-2 were rejected under 35 U.S.C. §102(b) over Roger, U.S. Patent No.

4,258,380. Claim 1 has been amended to provide for a plurality of diffusions in the second layer, the "plurality of diffusions being separated by invertible channels in said second layer." This limitation is not shown or suggested by Roger in combination with other limitations of claim 1. Roger, therefore, does not anticipate claim 1. Reconsideration is requested.

Claim 2 depends from claim 1, and, therefore, includes its limitations. This claim includes other limitations which in combination with those of claim 1 is not shown or suggested by the art of record. Reconsideration is requested.

Claims 1-9 were rejected under 35 U.S.C. §103(a) over Merrill et al., U.S. Patent No. 5,661,314. With respect to claim 1, it has been recognized that Merrill et al. do not disclose a second layer that has a uniform doping concentration as provided for in claim 1. Merrill et al. show diffusion of dopants into the second layer. It has been stated, however, that because it is well known in the art that doping can be carried out during the epitaxial growth of the first layer, the process of Merrill et al. can be modified to produce a second layer that has a uniform doping concentration. As a motivation for altering the process described in Merrill et al., it has been set forth that by modifying the process set forth in Merrill et al. to provide for epitaxial growth of the second layer "the usually lengthy doping process through diffusion can be eliminated." The position taken in the Office Action, therefore, appears to be that through an obvious modification of the process shown by Merrill et al. the semiconductor device of claim 1 can be obtained.

Claim 1 is drawn to a semiconductor device, and not a process for manufacturing of a semiconductor device. No motivation or suggestion has been shown for modifying the device that is shown by Merrill et al. to obtain the semiconductor device that is claimed in claim 1. Specifically, there is no prior art reference in the record that suggests or provides a motivation for modifying the device that is shown by Merrill et al. to include a second layer that has a uniform concentration of dopants. Therefore, it is submitted that claim 1 is not obvious over Merrill et al.

Moreover, it is submitted that contrary to what has been set forth in the Office Action, the modification of the process shown by Merrill et al. is not obvious in that no prior art reference in the record teaches the modification of process shown by Merrill et al. according to the suggestions set forth in the Office Action. Specifically, no prior art reference has been cited which teaches that the diffusion of the second layer in Merrill et al. can be replaced with epitaxial growth in order to avoid a lengthy diffusion step. Therefore, to the extent that the Office Action concludes that claim 1 is obvious because the process shown by Merrill et al. can be modified in an obvious manner to produce the device of claim 1, it is submitted respectfully that the conclusion of the Office Action does not find a basis in the cited prior art. Rather, it has resulted from a reconstruction of the subject matter of claim 1 based on the information provided in the application, and particularly after the differences between the claimed subject matter and the art of record were pointed out during prosecution. Reconsideration of claim 1 is requested.

Claims 1-9 were rejected under 35 U.S.C. §103(a) over Muramoto, U.S. Patent No. 4,884,113. Claim 1 provides for a plurality of diffusions separated by "invertible channels in said second layer." Muramoto shows only invertible channels formed in the first layer, and does not show or suggest having invertible channels in the second layer. Also, claim 1 provides that the second layer includes "impurities of the same type as those in said first layer uniformly distributed therethrough". Muramoto does not show or suggest a uniform distribution of dopants in its second layer. In addition, the structure in Muramoto is directed at reduction of the JFET resistance. Muramoto thus provides an N⁺ shell (12) to reduce the lateral diffusion so that the resistance from the JFET region (18) becomes smaller. In a structure according to the invention that is claimed in claim 1, the resistance contributed from both the JFET region and the bottom epitaxial layer are reduced. This is because the second layer is thicker than the junction depth and has a higher dopant concentration. This results in the shortening of the lateral diffusion in the JFET region and the reduction of the resistivity of the epitaxial layer. As stated in the specification these two effects, when combined, reduce the on-resistance by about 10%. Muramoto does not show or suggest combining these effects to achieve a lower on-resistance. Reconsideration of rejection of claim 1 over Muramoto in view of the foregoing is requested.

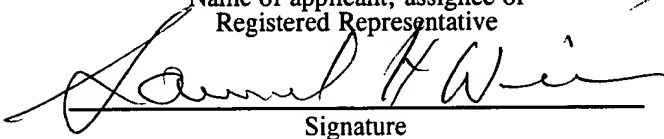
Claims 2-9 depend from claim 1, and, therefore, include its limitations. These claims include other limitations which in combination with those of claim 1 are not shown or suggested by the art of record. Reconsideration is requested.

The application is now believed to be in condition for allowance. Such action is earnestly solicited.

I hereby certify that this correspondence is being deposited with the United States Postal Service with sufficient postage as First Class Mail in an envelope addressed to: Asst. Commissioner for Patents, Washington, D.C. 20231, on August 22, 2001:

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Name of applicant, assignee or
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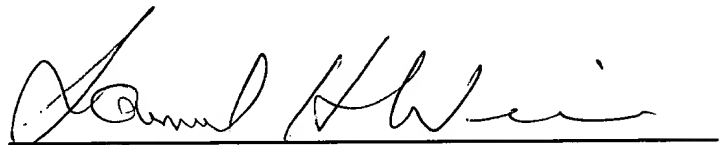


Signature

August 22, 2001

Date of Signature

Respectfully submitted,



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